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TEXTILES AND CLOTHING

SELECTED LIST OF REFERENCES ON THE PHYSICAL TESTING OF FABRICS

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FOREWORD

This bibliography contains English, French, German, and a few Dutch books and articles on the physical testing of fabrics. Only those references to methods of testing, descriptions of instruments, or studies of methods have been included. Although the continental literature has not been searched exhaustively, an effort has been made to have this complete back to 1925, some citations of an earlier date being included.

The references are arranged by subjects, which are in turn classified chronologically according to authors. Citations are made in accordance with the procedure used in the Journal of Agricultural Research. Abbreviations of titles of periodicals are those employed in the Experiment Station Record and are listed in United States Department of Agriculture Department Bulletin 1330.

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GENERAL

(1) Anonymous.
Directions for the study of unvarnished textile fabrics. Jour. Inst. Elect. Engin. 63: 133-146, illus. 1925. (Report from Brit. Elect. & Allied Indus. Research Assoc.)
Directions are given for determining yarn count, twist, breaking strength of yarn and fabric, thread count, thickness, tearing and bursting strength and aging.

(2) ________
Verslagen en mededeelingen van de afdeeling handel en nijverheid van het departement van arbeid, handel en nijverheid. [Reports and contributions of the section of commerce and industry, Department of Labor, Commerce, and Industry.] Jaargang No. 3 (1), 53 pp., illus. 1928. [Abstract in Jour. Textile Inst. 20: A405-A407. 1929.]
Describes methods and instruments for textile testing.

(3) ________
Tentative specifications for tolerances and test methods for knit goods. Amer. Soc. Testing Materials Proc. 28. (pt. 1): 1099-1102, illus. 1928.
The methods for testing knit goods are outlined.

(4) ________
A handbook of hosiery testing. 51 pp. New York, U. S. Testing Co. 1930.
Outlines the methods for analyzing hosiery.

(5) ________
Standard general methods of testing woven textile fabrics. Amer. Soc. Testing Materials Standards. Pt. 2, pp. 1102-1106, illus. 1930.
The general methods for textile testing are given.

(6) ________
Report of the sub-committee on shrinkage of textiles. Amer. Dyestuff Reptr. 22 (2): 44-45. 1933.
Reports an investigation of eight different wash tests for determining shrinkage.

(7) ________
Standard specifications for tolerances and test methods for certain light and medium cotton fabrics. Amer. Soc. Testing Materials Proc. 33: 432-433. 1933.
Shrinkage test using a 20 by 20 sample to be added to test methods for cotton fabrics.

(8) Anonymous.
Federal specification for textiles; test methods.
Federal Standard Stock Catalogue Section IV. Part 5.
CCC-T-191, 14 pp. Washington, D. C., Supt. Documents,
Govt. Printing Off. 1933.
General test methods are described.

(9) __________
A.S.T.M. standards on textile materials.
246 pp. Philadelphia, Amer. Soc. Testing Materials. 1935.
The work of committee D-13 has been compiled in this one volume. The standard general methods of testing woven textile fabrics are given on pp. 1-8.

(10) __________
Bases of serviceability tests. Daily News Record Nov. 8: 11; Nov. 15: 11; Nov. 22: 11; Nov. 29: 11; Dec. 6: 11; Dec. 13: 11. 1935.
Gives the proposed Commercial Standard for testing and reporting woven dress fabrics with reference to breaking strength; color fastness to crocking; cleaning (dry and wet), dry pressing, laundering, light and perspiration, shrinkage upon laundering and cleaning (dry and wet), and yarn slippage of dress fabrics.

(11) Barker, A. F., and Midgley, E.
Analysis of woven fabrics. Ed. 2, 322 pp., illus.
London, Scott, Greenwood & Son. 1922.
Methods of analysis are given. Chapters on the dyeing and finishing of cloths are also included.

(12) Chittick, J.
Counting threads in fabrics. Textile World 60: [3623], [3625]; 61: 331, 380. 1921-1922.
Various types of counting glasses are described and directions are given for counting the threads in fulled, napped, pile, and sateen stiped fabrics.

(13) Denham, W. S., Hutton, E. A., and Lonsdale, T.
Electrical resistance of yarns and cloth. Faraday Soc. Trans. 31: 511-519. 1935. [Abstract in Sci. Abs., Sect. A 38: 438. 1935.]
A method has been developed for routing work on the electrical resistance of textiles.

(14) Griffin, R. C.
Technical methods of analysis. 936 pp., illus. New York, McGraw-Hill. 1927.
Methods for testing fabrics and yarns are described.

(15) Hartley, H.
Fabric analysis - the contraction of warp and weft. Jour. Textile Inst. 17: T254-T258, illus. 1926.
Reports method of determining crimp.

(16) Haven, G. B.
Future textile laboratory practice. Amer. Dyestuff Reptr. 19 (21): [757] -761, 782-785, illus. 1930.
A brief outline is given of tests for determining yarn balance, corkscrew and crimp of yarns, rate and amount of water absorption, yarn slippage, bursting strength, thickness, abrasion, heat flow, and resilience. Includes novel methods of preparing the strips for the yarn slippage test.

(17) __________
Mechanical fabrics. 905 pp., illus. New York, John Wiley and Sons. 1932.
Chapters on the design and equipment of laboratories and on textile laboratory practices are included. Diagrams and descriptions of apparatus are given, and various test methods are critically reviewed.

(18) __________
Handbook of industrial fabrics. 538 pp., illus. New York, Wellington Sears Co. 1934.
Includes a chapter on laboratory design and practice and one on specifications and test methods. Many illustrations are reproduced from Mechanical Fabrics. See citation (17).

(19) Heerman, P., and Herzog, A.
Mikroskopische und Mechanisch-Technisch Textiluntersuchungen. [Microscopic and mechanical-technical textile investigations.] Ed. 3, 451 pp., illus. Berlin, Julius Springer. 1931.
Methods and apparatus for textile testing are given. There are sections on determining abrasion, air permeability, bursting strength, tensile strength, waterproofness, and yarn count.

(20) Kurokawa, K.
Acoustic constants of cloth. Jour. Inst. Elect. Japan 415: 113-141. 1923. [Abstract in Sci. Abs. Sect. A 26: 974. 1923.] [Original not seen.]
Describes a new method called "surge impedance density" for measuring the acoustic constants of cloth.

(21) Matthews, J. M.
Textile fibers. Ed. 4, 1053 pp., illus. New York, John Wiley and Sons. 1924.
This book contains three chapters on fabric analysis and fabric testing.

(22) Mercier, A. A.
Coefficient of friction of fabrics. U. S. Dept. Com., Bur. Standards Jour. Research 5 (2): 243-246, illus. 1930.
Reports simple method for specifying the slipperiness of fabrics.

(23) Mereness, H. A.
Tentative standard method for the determination of slippage in silk and rayon broad goods. Rayon and Melliand Textile Monthly 16 (2): 71, illus. 1935.
Describes a method for determining elongation curves and a way to calculate the pull required to produce a slippage of one-fourth inch on both sides of a seam.

(24) Morrow, J. A.
The frictional properties of cotton materials. Jour. Textile Inst. 22: T425-T440, illus. 1931.
The apparatus, as described, measures the force of friction between the cloth specimen and any desired surface.

(25) Morton, W. E., and Turner, A. J.
Influence of the degree of twist in yarns on the results of yarn mercerization, and on the properties of plain fabrics made from grey or mercerized cotton yarns. Part II. The results of various strength tests on fabrics. Jour. Textile Inst. 19: T189-T222, illus. 1928.
A new machine for wear-testing is described. Impact tests and rip strength tests were studied.

(26) Myers, W.
Effect of structure on the strength and wearing qualities of cloth. Textile World Rec. 48: 89-96, illus. 1914.
The author proposes cutting strips for breaking strength on a 45° diagonal. A cylinder rubbing machine is also described for use in determining the wear resistance of fabrics.

(27) Posselt, E. A.
Fabric analysis. 231 pp., illus. Philadelphia, Textile Publishing Co. [n.d.]
Methods and instruments for testing fabrics are given.

(28) Schwarz, E. R., and Hotte, G. H.
Optical measurement of yarn waviness as distinct from crimp. Textile Research 3: 14-26, illus. 1932.
The mechanical and micro-methods for measuring crimp are described and compared.

(29) Strauss, W.
Clothing: Testing. Alberhalden's Handbuch Biol. Arbeitsmethoden Abt. IV. teil 11: 87-178. [Abstract in Jour. Textile Inst. 20: A509. 1929.]
Outlines general microscopical, chemical, and physical methods of testing textiles.

(30) Turner, A. J.
Random and systematic selection of warp specimens in cloth sampling. Jour. Textile Inst. 22 (2): T77-T97, illus. 1931.
The results obtained by the random and systematic methods of sampling are compared. Results are not vitiated by using the systematic method but in general the author advocates random selection.

AIR PERMEABILITY

(31) Anonymous.
An improved densometer for textiles. Textile World 78 (3): 321. 1930.
The densometer is an instrument for determining the time required for a known amount of air to pass, under approximately constant pressure, through a known area of the material under test.

(32) Barr, G.
Measurement of the porosity of textiles. Jour. Textile Inst. 23: P206-P213, illus. 1932.
The fabric clamps are designed to prevent and detect any leakage of air. The time required for a certain volume of air to pass through the sample is observed.

(33) Chuchrina, E.
Eine neue Prüfungsmethode der Luftdurchlässigkeit der Kleiderstoffe. [A new test method for the air permeability of clothing materials.] Arch. Hyg. u Bakt 111: 43-48, illus. 1933.
The method described requires no complicated apparatus. The pressure drop when a known amount of air is passed through a known area of fabric is measured.

(34) Clayton, F. H.
The measurement of the air permeability of fabrics. Jour. Textile Inst. 26 (6): T171-T186, illus. 1935.
The experimental procedure is given for testing ten random samples in 15 minutes. A fabric clamping device reduces the air leak to 1 percent.

(35) Edwards, R. S.
The air permeability of leather. Jour. Internatl. Soc. Leather Trades' Chemists 14 (9): 392-409, illus. 1930.
[Abstract in Jour. Tech. Assoc. Fur Indus. 1 (4): 170. 1930.]
Two experimental methods of determining air permeability of leather are described. One of the methods does not require the skin to be cut up.

(36) Herzog, G.
Ueber die Prüfung der Luftdurchlässigkeit von Geweben. [Concerning the testing of the air permeability of fabrics.] Mitt. K. Materialprufungsamt zu Grosslichterfelde West [Berlin] 30: 309-319, illus. 1912.
Discusses the experimental method and apparatus for determining air permeability. Both wet and dry fabrics were studied.

(37) March, M. C.
Some notes on the permeability of fabrics to air. Jour. Textile Inst. 22 (1): T56-T63, illus. 1931.
A description of the apparatus is given. Linen, duck, and knitted artificial silk are some of the fabrics studied.

(38) Sale, P. D., and Hedrick, A. F.
See citation (144)

(39) Schiefer, H. F., and Best, A. S.
A portable instrument for measuring air permeability of fabrics. U. S. Dept. Com., Bur. Standards Jour. Research 6 (1): 51-58, illus. 1931.
A description is given of the apparatus developed at the National Bureau of Standards to measure air permeability. The pressure drop across the fabric and across the orifice meter were measured to determine the volume of air passing through the fabric.

(40) Schmidt, P.
Zur Bestimmung der Luftdurchlässigkeit von Kleidungsstoffen. [On the determination of air permeability of clothing material.] Arch. Hyg. 70: [8]-16, illus. 1909.
Describes an apparatus for determining air permeability. In regard to air transfer, the fabric acts like a system of capillaries. The volume of air passing through is directly proportional to the pressure and indirectly to the resistance.

COLOR FASTNESS

(41) Appel, W. D.
A new lamp for fading tests. Amer. Dyestuff Reptr. 14: 882-885. 1925.
A 1,000-Watt gas filled Mazda lamp is surrounded by copper sulphate solution to remove the heat. The samples are mounted on a rotating disc while being exposed to the light of the lamp.

(42) ________
Method for measuring the color of textiles. Amer. Dyestuff Reptr. 17: 49-54, illus. 1928. [Abstract in Jour. Textile Inst. 19: A138. 1928.]
A description is given of the partial spectrophotometric method of measuring color.

(43) ________ Smith, W. C., and Christison, H.
Machine for laboratory washing tests. Amer. Dyestuff Reptr. 17: 679-683, illus. 1928. [Abstract in Chem. Abs. 23: 284. 1929.]
The proposed specifications for a washing machine to be used for fastness tests and the proposed general specifications for a standard laboratory washing procedure are outlined.

(44) Griffith, M. E., Brode, W. R., and Robertson, H.
A comparison of the fading produced by the fadeometer (type LV) and by sunlight. Ohio State Bimo. Bull. 169: 143-146. 1934.
The authors conclude that the fadeometer is a satisfactory substitute for sunlight for fading tests involving short periods such as 25 or 50 hours.

(45) Hall, R. O.
The conditions of temperature and relative humidity in testing fastness to light by means of artificial illumination. Amer. Dyestuff Reptr. 22 (15): [437] -441, 444, illus. 1933.
Describes the new type of fadeometer equipped to maintain the temperature and humidity of the sample at definite values.

(46) Cunliffe, P. W.
The measurement of the colour of textile fabrics and some applications to problems of fading. Jour. Soc. Dyers and Colourists 45 (11): [305] -321. 1929.
Discusses the methods and the instruments used to measure color.

(47) Cunliffe, P. W.
Standardizing the methods of testing the fastness of dyed materials. Textile Manfr. 57 (675): 110-111. 1931.
The author concludes that the fadeometer is moderately successful for silk and wool, while the fugitometer is a little better, but neither is completely successful in reproducing the effect of sunlight. He reports that a new lamp with a humidifying arrangement is being built to test fastness to light. In washing tests for color fastness he uses thermos bottles for temperatures up to 70°C.

(48) Hochbein, E., and Knebel, E.
Belichtungsversuche mit der Osram-Punktlichtlampe. [Fading investigations with the Osram-point lamp.] Melliand's Textilber. 6: 912-914, illus. 1925.
The lamp described emits light of the same spectral composition as sunlight.

(49) Jameson, C. W.
Foretelling color fastness with an artificial sun. Amer. Dyestuff Reptr. 21 (10): 306-313, illus. 1932.
The new model of fadeometer is equipped to control the humidity, temperature, and line voltage.

(50) Mees, C. E. K.
Color and its measurement. Amer. Soc. Testing Materials Proc. 30 (pt. 2): 9-25, illus. 1930.
Describes and discusses various types of colorimeters useful in determining color fading.

(51) Parker, R. G., and Jackman, D. N.
The fastness of dyed fabrics to laundering. Jour. Textile Inst. 19: T223-T232. 1928.
German and American test methods are compared.

(52) Trotman, S. R.
The testing of dyestuffs for fastness to washing. Jour. Soc. Dyers and Colourists 43: 192. 1927.
A method is described which does not rely on visual tests alone.

(53) Vass, C. C. N., and McSwing, B. A.
Fastness of dyes to perspiration; the composition of human perspiration. Jour. Soc. Dyers and Colourists 46: 190-195. 1930.
A study of the composition of human perspiration is reported.

DURABILITY

(54) Anonymous.
Measuring wearing value of cloth. Textile World Jour. 54: 943, 945, illus. 1918.
A description is given of an apparatus developed to test the wear on the seat of trousers. A cane chair seat was used as the abradant.

(55) __________
Abrasion testing machine. Textile World 68: 915, illus. 1925.
This machine was designed for testing hosiery. The stocking is placed on a form and the toe and heel rubbed against duck held under tension. If the hose withstands this treatment a definite length of time it is considered satisfactory.

(56) __________
Abrasion tester. Textile World 69: 2885, illus. 1926.
In this apparatus, the abrasion is produced by pulling a test strip of fabric, held under tension, to and fro through a steel comb.

(57) __________
Machine determines wearing qualities of textile fabrics. Textile World 78 (4): 55. 1930.
The United States Testing Laboratories have developed a reciprocating type machine for testing abrasion. The loss in tensile strength after abrading is taken as a measure of the wear.

(58) __________
Aus der Praxis des Arbeitens am Ernst Müllerschen Scheuerapparat. [On the use of Ernst Müller's abrasion apparatus.] Leipziger Monatsschr. Textil Indus. 45: 419-420, 455-457, illus. 1930. [Abstract in Jour. Textile Inst. 22: A263. 1931.]
Description of an abrasion machine designed by Ernst Müller and a modification that permits a view of the fabric, without stopping the machine.

(59) __________
Wear testing machine for carpets. Textile World 79 (3): 260-261. 1931.
Notes a machine, developed by the Mohawk Carpet Mills, that has an abrasive surface which tends to pull out the pile of the carpet.

(60) Anonymous.
Stutz emphasizes value of testing rayon linings dry. Daily News Rec., p. 69. April 7, 1933.
Briefly describes the abrasion tester with an oscillating cylinder used by Better Fabrics Bureau.

(61) Ashcroft, A. G.
Scientific control requisite in testing wearing qualities of woven floor covering. Textile World 80 (11): 957, illus. 1931.
A description and a critical discussion of the machine developed by the Mohawk Carpet Mills are given. See citation (59).

(62) Brackett, W. R., Floyd, E. V., and Dennen, A. C.
New abrasion machine controls temperature, humidity, pressure, tension, and rate of rubbing. Textile World 74: 3019-3020, illus. 1928.
Describes a machine designed at Kansas State Agricultural College. Serge was used as the abradant.

(63) Brassell, A. L.
Wear tests on carpets. Melliand 2 (10): 1358-1360, illus. 1931.
The machine designed by the United States Testing Company to test the wear on carpets simulates the scuffing action of the foot in walking.

(64) Crawshaw, H., Morton, W. E., and Brown, K. C.
Experiments in fabric wear testing. Jour. Textile Inst. 22 (1): T64-T76, illus. 1931.
Carborundum abrasive is used on the machine described. The loss in strength of the samples was determined after a definite number of rubs. The authors conclude that the tension of the fabric during abrasion has no significant influence on the strength loss.

(65) Davis, W., and Buckley, G. H.
Abrasion testing of knitted textiles. Jour. Textile Inst. 25 (4): T133-T140, illus. 1934.
The fabric held at a uniform tension was placed over an inflated leather ball, then rubbed with a wooden block covered with overcoating material. The time to rub to a hole is taken as a measure of the wear.

(66) Davis, W., and Buckley, G. H.
Temperature of abrasion in knitted fabrics. Jour. Textile Inst. 26 (2): T71-T76, illus. 1935.
Different rubbing blocks were used to speed up the test. See citation (65).

(67) Edwards, W. F.
Wearing tests on textile fabrics. Textile World 69: 3817, 3819, illus. 1926.
Discussion of abrasion tests that are suitable for the comparison of fabrics.

(68) Ethridge, R. P.
A machine for investigating the resistance of fabrics to abrasion. Testing 1 (2): 156-159, illus. 1924.
The apparatus described uses a hollow drum with bronze blades as the abradant. The drum reverses after each revolution.

(69) Gurney, H. P., and Davis, E. H.
Tensile strength: a limiting factor in wear. Jour. Textile Inst. 23: T201-T210, illus. 1932.
In the abrasion machine described, the cloth to be tested is held under fixed tension, while a comb consisting of four steel plates travels 3 inches with respect to the sample.

(70) Harvey, E. H.
Wyzenbeek precision wear test meter. Amer. Dyestuff Reptr. 21 (6): [177]-179, 203, illus. 1932.
The individual samples are held under definite tension and pressure. Different abrasives can be used on the drum.

(71) Haven, G. B.
New abrasion machine. Textile World 76 (18): 2654-2656, 2662, illus. 1929.
On this machine emery cloth is used with different size rollers, the size being dependent on the weight of the cloth to be tested. See also citation (17, pp. 298-309.)

(72) Kapff, S.
Ueber den Einfluss chemischer und physikalischer Einwirkungen auf die Wolle und die Prüfung der Tuche auf ihre Tragfähigkeit. [On the chemical and physical treatment of wool and the testing of the durability of fabrics.] Melliand's Textilber. 4(4): 181-188, illus. 1923.
Several machines for abrasion are described. Includes one using the test material as abradant, which, according to the author, duplicates the wear a cloth would receive in actual use.

(73) Lester, J. H.
Avenues of progress in the textile industry. Jour. Textile Inst. 26 (6): 95-108. 1935.
The lecturer pointed out that no machine will simulate all conditions of "wear" and briefly described three, each designed to give a different test.

(74) Matthew, J. A.
A cloth wear testing machine. Jour. Textile Inst. 21: T546-T560, illus. 1930.
The design of cloth wear testing machines is discussed. The machine described here embodies several new features.

(75) Müller, W.
Die relative und absolute Dauer der Webstoffe. [The relative and absolute durability of fabrics.] Melliand Textilber. 14: 585-586. 1933.
The "Tritometer" with a constant rubbing surface under regular pressure and speed was used, and the time to produce a constant size hole was determined.

(76) Myers, W.
See citation (26).

(77) Scheid, E. M.
Ein neues Schnellverfahren zur Prüfung der Haltbarkeit von Teppichen. [A new rapid method for testing the durability of carpets.] Melliand Textilber 14 (6): 286-290, illus. 1933. [Abstract in Jour. Textile Inst. 24: A471. 1933.]
A wear testing devise has been constructed in which a stamp is given horizontal and vertical motions designed to simulate the action of the foot on carpets. Examination of samples subjected to wear on this devise show that the wear effects are similar to those observed on carpets in actual use.

(78) Schiefer, H. F., and Best, A. S.
Carpet wear testing machine. U. S. Dept. Com., Bur. Standards Jour. Research 6 (6): 927-936, illus. 1931.
A machine has been designed for wear testing of carpets. Tests are being made to determine if the results are a satisfactory measure of the probable relative durability of carpets in service.

(79) Schniewind, H. Z.
Tissue abrasion tester. Instruments 3 (9): 596, illus. 1930.
Description of a machine designed by Schopper that combines both rotary and rolling motions.

(80) Schwarz, E. R.
Machine for determining the resistance of fabrics to external abrasion. Textile World 72: [739]. 741, 743, illus. 1927.
Emery cloth served as the abradant. Means of judging the progress of the abrasion in wear tests are discussed. Loss in tensile strength is considered a fair test.

(81) Simon, C. L.
Wearing qualities of synthetic yarn lining fabrics and methods used in testing. Melliand Textile Monthly 5 (1): 13-14; (2): 58-59; (3-4): 108-110, illus. 1933, and Textile World 83 (4): 576-577. 1933.
Describes the perspirator, an apparatus for making wearing tests under conditions of temperature, rubbing, and moisture comparable to those for a lining material in actual use.

(82) Smith, G. R.
See citation (122).

(83) Walther, J.
Ein Beitrag zur Kenntnis der Prüfung der Gewebe auf ihre Abnutzungfestigkeit. [A contribution to the knowledge of testing fabrics upon their wear strength.] Spinner und Weber 51 (30): 1-6, illus. 1933.
Experimental procedure is given. Lists four ways of judging the amount of abrasion produced.

LUSTER

(84) Anonymous.
New device for analyzing transparent and opaque colors and gloss. Melliand 2: 281-282. 1930.
The color analyzer developed by Razek and Mulder is described. A slight modification will adapt it to measure gloss.

(85) Barratt, T.
The lustre produced in cotton by mercerization. Faraday Soc. Trans. 20 (pt.2): 240-250, illus. 1924.
A photometer arrangement is used to measure the luster of fibers, threads or fabrics.

(86) Boffey, H., and Derrett-Smith, D. A.
A new lustre-meter and spectrophotometer. Jour. Sci. Instruments 8: 356-360, illus. 1931.
This instrument with the aid of filters can be used to measure the luster of colored samples. The test sample need not be cut for the determination.

(87) Ginsberg, I.
Lustre and its determination. Textile Colorist 47: 96-98, illus. 1925.
Describes three methods for measuring luster.

(88) Hunter, A. S.
The glossmeter. An instrument for measuring the gloss, specular reflection and texture of surfaces. Rayon and Melliand Textile Monthly 15 (6): 283-284, illus. 1934.
The amount of light specularly reflected from the test surface is compared with that reflected from a standard gloss surface of polished black glass.

(89) Ingersoll, L. R.
The glarimeter. An instrument for measuring the gloss of paper. Jour. Optical Soc. Amer. 5: 213-217, illus. 1921.
The instrument measures gloss in terms of the fraction of the reflected light that is polarized.

(90) Klughardt, A.
Ueber die Bestimmung des Glanzes mit dem Stufenphotometer. [The determination of luster with the Stufen photometer.] Ztschr. Tech. Phys. 8: 109-119, illus. 1927.
A description and the mathematical treatment of the method are given.

(91) __________
Die Bestimmung des Glanzes an bunten Oberflächen. [The determination of luster on colored surfaces.] Melliand Textilber. 9: 133-136, illus. 1928.
The method described in (74) is applicable to the measurement of the gloss of colored surfaces when filters are used.

(92) __________
Ueber eine Abänderung der Glanz-Messmethode mit dem Stufenphotometer. [A modification in the method of measuring luster with the Stufenphotometer.] Leipziger Monatsschr. Textil Indus. 45: 409-410, 444. 1930.
The sample is compared with barium white when viewed at different angles.

(93) Naumann, H.
Glanzmessung an Geweben. [Luster measurements on fabrics.] Ztschr. Tech. Phys. 8: 239-243, illus. 1927.
The author uses the apparatus described by Klughardt and shows a graphical method for measuring the variation in luster upon rotating the sample in its own plane.

(94) Nutting, R. D.
Interpretation of data obtained with spectrophotometers of the polarizing type. Textile Research 5 (9): 391-400. 1935.
It is recommended that the spectrophotometric examination of samples exhibiting polarization be made either with the sample rotating or at 2 azimuths 90° apart and the results averaged arithmetically to obtain the reflection (or transmission) factor for ordinary unpolarized light.

(95) Pelton, M. O.
The lustre of textile fibers and a method of measurement. Trans. Optical Soc. London. 31 (4): 184-200, illus. 1932.
A photometer cube is used to compare the test surface with the comparison surface.

(96) Pfund, A. H.
The measurement of gloss. Jour. Optical Soc. Amer. 20: 23-26, illus. 1930.
Describes an instrument for measuring gloss with which the sample is rotated rapidly to remove surface irregularities.

(97) Schulz, H.
Ueber Glanz und Glanzmessung. [Luster and luster measurements.] Melliand Textilber. 5 (1): 25-27, illus. 1924.
This article discusses luster and several arrangements for measuring the luster of paper and fabrics.

STIFFNESS

(98) Durst, G.
Zur Bestimmung der Steifheit von Geweben. [For the determination of the stiffness of fabrics.] Melliand Textilber. 14 (6): 308-309, 1933. [Abstract in Jour. Textile Inst. 24: A471. 1933.]
A new method is described in which one end of a strip of fabric is fixed to a scale pan of a balance and the other end is fastened to a clamp fixed above the pan. Weights are added to the other pan to balance the force exerted by the strip which acts as a U-shaped spring.

(99) Grimshaw, A. H.
Measuring stiffness of sized cloth. Textile World 61: 2965, 2967, illus. 1922.
In the apparatus described, the strip of fabric is supported at one end and the amount it bends under its own weight is measured.

(100) Oliver, D. A.
Precision stiffness meter. Jour. Sci. Instruments 7: 318-322, illus. 1931. [Abstract in Sci. Abs., Sect. A, 34 (399): 177. 1931.]
This gauge was designed to measure the stiffness of telephone diaphrams.

(101) Peirce, F. T.
The "handle" of cloth as a measurable quantity. Jour. Textile Inst. 21 (9): T377-T416, illus. 1930.
The experimental method, a discussion of the various factors influencing stiffness, and the mathematical basis of the stiffness test are included.

(102) Peterson, E. C., and Dantzig, T.
A quantitative method for measuring stiffness. U. S. Dept. Agr. Tech. Bull. 108, 29 pp., illus. 1929.
Reports the experimental method. A derivation of the necessary formulae is given.

(103) Schiefer, H. F.
The flexometer, an instrument for evaluating the flexural properties of cloth and similar materials. Textile Research 3 (8): 388-403, illus., 1933, and Natl. Bur. Standards Jour. Research 10 (5): 647-657. 1933.
Describes an instrument for measuring the resistance of a fabric to folding or bending.

TENSILE STRENGTH

(104) Anonymous.
Tests strength of fabric. Textile World 74: 3383. 1928.
A description is given of the ball burst attachment for the Scott tester.

(105) __________
Bursting strength tester. Melliand 2 (6): 858-860, illus. 1930.
The "Schopper-Dalen" tester has a special instrument to measure the height of convexity before the sample breaks.

(106) Anonymous.
Tear resistance. Standard specifications for tolerances and test methods for certain light and medium cotton fabrics. Amer. Soc. Testing Materials Proc. 30 (pt. 1): 1279-1280. 1930.
Two methods for determining tear resistance are described.

(107)_________
See citation (5).

(108)_________
Tearing tester. Melliand 2 (7): 985-986, illus. 1930.
The Elmendorf tester indicates in grams the resistance of fabricated materials to tearing.

(109) Barr, G.
The effect of the dimensions of test-pieces on the results of the tensile test on textile fabrics. [Gt. Brit.] Dept. Sci. and Indus. Research. Rept. 2 of the Fabrics Coordinating Research Com., pp. 140-152, illus. 1930.
A study was made of the results of tensile strength determinations when samples of various lengths and widths were broken. Concludes that the dimensions of test pieces are arbitrary.

(110) Bercsi, J.
Rejto method of testing cloths. Textile World 67: 2992-2993, illus. 1925.
Describes the machine and a special ruler for measuring diagrams drawn by the machine.

(111) Burkley, C. J.
Useful test for fabric strength. Textile World 66: 483, 487, 493, 1924.
Discusses four strength tests, namely, breaking, bursting, tearing, and impact. The author believes the bursting strength is approximately proportional to the square root of the extensibility.

(112) Foster, B. H.
Bursting and grab tests for knit fabrics compared. Textile Research 3: 281-286, illus. 1933.
The bursting strength was determined with a Mullen tester, a special 4-inch machine, and a special 8-inch machine. When corrected for diaphragm error and when the size opening is considered, the machine makes no difference in results. The bursting strength for any knit fabric is equal to the strength of the courses as obtained by the 1 by 1 by 1 inch grab test.

(113) Hamm, H. A., and Stevens, R. E.
A method of measuring the stress-strain relations of wet textiles with application to wet rayons. U. S. Dept. Com., Bur. Standards Jour. Research 3 (6): 927-936, illus. 1929.
An immersion tank was developed as auxiliary equipment for the recording stress-strain tester. The liquid is poured in after the sample has been placed in the jaws of the tester.

(114) Hathaway, R.
Comparison of tensile strengths by bursting and grab methods. Melliand 1 (3): 375-378. 1929. [Abstract in Jour. Textile Inst. 20: A619. 1929.]
A mathematical analysis shows that the relation between the grab and bursting strength tests varies with the construction of the cloth.

(115) Lewis, W. S.
Comparison of strip and grab methods of testing textile fabric for tensile strength. Amer. Soc. Testing Materials Proc. 16(pt.1): 366-369, illus. 1916.
From this study the author concludes that no general relation exists between the results obtained by the strip and grab methods.

(116) McGowan, F. R., and Hamlin, C. H.
Method of testing knitted fabric. Textile World 67: 3285, 3287, illus. 1925.
Recommends for breaking strength determinations of knitted fabrics, that samples be 4 inches wide, and the front jaws of the tester be 1 inch wide, and 1 inch apart.

(117) Moore, V. B.
Two methods of calculating comparisons in tensile strength. Melliand 2 (9): 1176-1177. 1930.
A comparison is made of the bursting strength with the strength predicted from breaking strength tests.

(118) Pickard, R. H., and Wallace, W. M.
Mechanical and physical tests for textile fabrics. Jour. Textile Inst. 10: 240-244, illus. 1919.
The authors describe machines for making impact and repeated stress tests for determining the strength of fabrics.

(119) Schubert, F.
Ueber eine neue Materialprüfart. [Concerning a new material test.] Kautschuk 6 (10): 207-210. 1930.
A modified tear test suitable for small samples is reported.

(120) Schwarz, E. R.
Stretch in test specimens. Fibre and Fabric 84 (2421): 19-22, illus. 1931.
Outlines a rapid method for measuring the stretch of a sample from the diagrams drawn by the autographic recorder when making breaking strength determinations.

(121) Scott, D. C.
Recent developements in tensile testing machines. Amer. Dyestuff Reptr. 24 (5): 120-124, illus. 1935.
This new machine with a constant rate of loading can be used to study the effect of repeated loadings on textiles.

(122) Smith, G. R.
Testing strength of materials. 122 pp., illus. London, E. Marlborough & Co. 1922.
Methods for testing yarns and fabrics are given. A wear testing machine with revolving blades is also described.

(123) Turner, A. J.
Strength of fabrics. Jour. Textile Inst. 11: 181-188, illus. 1920.
Describes tests to determine the tearing and impact strength of cloths. Also discusses the effects of rate of loading and dimensions of specimen on the results of strength tests.

(124) Walen, E. D.
Comparison of strip and grab methods of testing textile fabrics for tensile strength. Amer. Soc. Testing Materials Proc. 16(pt. 1): 370-376, illus. 1916.
The number of threads in the test piece were considered when comparing the strength as determined by the grab and strip methods.

(125) Whitcomb, H. H.
Strength test for knitted fabrics. Textile World 73: 1701-1702, illus. 1928.
In this test the ball burst attachment replaced the jaws of the Scott tester for determining the bursting strength.

THERMAL PROPERTIES

(126) Angus, T. C.
Heat retaining properties of clothing, computed on a physiological basis. Jour. Textile Inst. 26 (2): T83-T86, illus. 1935.
The apparatus described was designed to simulate as nearly as possible the actual conditions of temperature, contact, and air movement for clothirg in actual use.

(127) Freedman, E.
Thermal transmission of fabrics. Textile World 78 (1): 58-59, 97, illus., 1930, and Amer. Soc. Testing Materials 30(pt. 2): 1025-1040. 1930.
Uses an electrical method to determine heat transmission of fabrics when exposed to air at controlled temperatures and wind velocities.

(128) Gregory, J.
An experimental method for investigating the thermal properties of cotton fabrics. Jour. Textile Inst. 17: T553-T566, illus. 1926.
Some experimental methods are described for studying and comparing the thermal properties of fabrics.

(129) ________
The absorption, transmission and reflection of radiant heat by fabrics. Jour. Textile Inst. 21 (2): T57-T65, illus. 1930.
Reports the experimental method. Various types of fabrics were studied in relation to the protection they offer.

(130) Haven, G. B.
Testing blankets for heat transmission. Textile World Jour. 52: [3307] -3309, illus. 1917.
In the experimental procedure as outlined for measuring heat transmission, the sample under test was wound on a pipe maintained at blood temperature.

(131) ________
Modern methods of testing blankets for heat transmission. U. S. Dept. Com., Bur. Standards Misc. Pub. 19: 33-40, illus. 1918.
The ends of the heated pipe described in citation (130) were insulated. An instrument for measuring the thickness is also given.

(132) Hess, K.
A comparative study of the protective value of certain fabrics in still and moving air. Melliand 2 (12): 1533-1536, illus. 1931.
See citation (133). The ratings for seven fabrics are included.

(133) ________ Floyd, E. V., and Baker, L.
A comparative study of the protective value of certain fabrics in still and moving air. Jour. Agr. Research [U. S.] 41 (2): 139-146, illus. 1930.
Describes the calorimeter and wind tunnel used in determining the heat transmission of fabrics in still and moving air. A curve was plotted for the thickness at different loads and was extrapolated to zero loading to obtain the thickness of the fabric.

(134) Leusden, F. P.
Zur Bestimmung des Wärmehaltungsvermögens von Bekleidungsstoffen. [On the determination of the heat retension of clothing materials.] Ztschr. Hyg. u. Infektionskrank. 109: 616-618. 1929. [Abstract in Bull. Hyg. 4: 954. 1929.]
Using the katathermometer, the author shows that the heat protecting effect is dependent on the hygroscopic moisture of the fabric.

(135) Marsh, M. C.
Thermal insulating properties of fabrics. Proc. Phys. Soc. [London] 42 (pt. 5, No. 235): 570-588. 1930; and Jour. Textile Inst. 22 (5): T245-T273, illus. 1931.
An electrical method is used to determine the heat insulation of fabrics.

(136) __________
The transmission of heat through fabrics. Proc. Phys. Soc. [London] 45 (pt. 3, No. 248): 414-424, illus. 1933.
Includes experimental method and a statistical treatment of the data.

(137) McGowan, F. R., and Sale, P. D.
Heat retaining properties of fabrics. Textile World 63: 2607-2609, 3041-3043, 1923.
Discussion of the work at the National Bureau of Standards on blanket materials. The apparatus described in citation (144) has been modified in order to test the samples in a breeze.

(138) Miller, L. F.
Relation of heat transmission to humidity in insulating materials. Phys. Rev. (2) 29: 370-371. 1927. [Abstract in Jour. Textile Inst. 18: A212. 1927.]
The results indicate that heat transmission of textile fibers increases linearly as the moisture content increases. The hot and cold plate apparatus used has a guard ring.

(139) Mönch, E.
Experimentelle Bestimmung des Wärmeschutzes von Kleiderstoffen. [Experimental determination of the heat protection of clothing materials.] Melliand Textilber 16 (1): 24-26, 28. 1935.
Gives a description of apparatus, and the experimental method used in a study of the heat protection offered by eight fabrics when directly against the hot body and when separated by an air layer.

(140) Müller, A.
Die Anwendung des "Davoser Frigorimeters" zur Bestimmung des Wärmehaltungsvermogens von Kleiderstoffen. [Application of the "Davos frigorimeter" to the study of the thermal properties of clothing materials.] Arb. Reichsgsndhtsamt [Germany] 57: [314]-317. 1926.
Fabrics used for men's and women's stockings were examined by using the Davos frigorimeter in both still and moving air at temperatures around 8° C. A description of the apparatus is included.

(141) Priestman, H.
Heat-retaining properties of woolen and worsted cloths. Jour. Leeds Univ. Textile Assoc. 7: 35-39. 1921-1922. [Reprinted in Textile World 62: 1426-1429. Abstract in Jour. Textile Inst. 12: 324. Original not seen.]
The rate of cooling of cylinders covered with fabrics was determined. Experiments were conducted in still air and in air currents from an electric blower.

(142) Rood, E. S.
Thermal conductivity of some wearing materials. Phys. Rev. (2) 18: 356-361. 1921.
The author measured the conductivity of knitted and woven cotton, wool, linen, and silk materials, using the disk method of Lees.

(143) Sale, P. D.
Specifications for constructing and operating heat-transmission apparatus for testing heat-insulating value of fabrics. U. S. Dept. Com., Bur. Standards Technol. Paper 269: 595-607, illus. 1924.
Supplement to paper 266. See citation (144). Instructions are given for constructing the heat transmission apparatus.

(144)__________ and Hedrick, A. F.
Measurement of the heat insulation and related properties of blankets. U. S. Dept. Com., Bur. Standards Technol. Paper 266: 529-546, illus. 1924.
The experimental methods are described for determining the heat transmission, air permeability, and permeability to water vapor of fabrics.

(145) Schiefer, H. F.
An apparatus for measuring thermal transmission of textiles. Melliand Textile Monthly 3 (2): 162, illus. 1931.
The apparatus developed at the National Bureau of Standards is briefly described.

(146) Spafford, A. L.
Improved apparatus for measuring thermal conductivity. Ice and Refrig. 72: 176-177, illus. 1927.
A hot plate method was used to determine the heat transmission of insulating materials. To measure the thickness of compressible materials, the thickness of glass plates was measured with a micrometer, alone and with the test sample between.

(147) Speakman, J. B., and Chamberlain, N. H.
Thermal conductivity of textile materials and fabrics. Jour. Textile Inst. 21: T29-T56, illus. 1930.
The conductivity of fabrics held between metal plates was determined with an apparatus designed on the principle of the Bunsen ice calorimeter. Fabrics of different weaves and finishes were studied.

(148) Staff, H.
The effect of humidity on the thermal conductivity of wool and cotton. Phys. Rev. (2) 25: 252. 1925. (Abstract of paper presented at the meeting of the Amer. Phys. Soc. held December 29-30, 1924, in Washington, D.C.)
Lees' disk method is used for determining the thermal conductivity of fabrics. Layers of material of any moisture content desired are placed between a central, electrically heated disk and two outer copper disks which are water cooled. Some experimental values are reported.

(149) Techoueyres, E., and Walbaum, M.
Note au sujet des qualities d'isolement thermique, de perméabilité et d'affinité pour l'eau présentées par les diverses sortes d'etoffes utilisées comme sous-vêtements. [Note on the heat insulation, permeability, and affinity for water offered by different materials used for garments.] Bull. Acad. Med. [Paris] (3) 98: 107-109. 1927. [Abstract in Bull. Hyg. 3 (11): 991. 1928.]
The experimental methods are described. The conclusion drawn from this work is that woolen cloths of the flannel type are best suited for underwear.

(150) Vintschger, J.
Das Wärme-isolieurungsvermogens der Kleidungsstoffe, gemessen mit Hilfe des Davoser Frigorimeters. [The heat insulation of clothing materials measured with the Davos frigorimeter.] Arch. Hyg. u. Bakt. 101 (5): [261]-289, illus. 1929.
The protection offered by fabrics in still and moving air was studied by means of the frigorimeter and the katathermometer. Experimental values and a description of the apparatus are given.

THICKNESS

(151) Cartland, F. W.
Practical method and new gage developed for measuring quantity of nap on canton flannel. Textile World 74 (4): 425-426, 431, illus. 1928.
The gage and experimental method are described.

(152) Emley, W. E.
Measurement of thickness of textiles and similar materials. Amer. Soc. Testing Materials Proc. 31 (pt. 1): 608-611. 1931.
Discusses methods for determining the thickness of textiles. Specifications and tolerances are given for a gage proposed as a standard.

(153) Haven, G. .
Future textile-laboratory practice. Textile World 79 (1): 42-44, illus, 1931.
Proposes a modification of the thickness gage in general use, to insure a uniform rate of dropping the pressor foot.

(154)__________
New fabric thickness-measurer. Textile Research 3: 229-237, illus. 1933.
The variables present in gage measurements are discussed and a new instrument designed to overcome these variations is described.

(155)__________
See citation (130).

(156) Hays, M. B.
A method for determining the thickness of pile and napped fabrics. Jour. Home Econ. 23: 560-564, illus. 1931.
In the method described, the cross-sectional area of a sample is measured optically.

(157) Hess, K., Floyd, E. V., and Baker, L.
See citation (133).

(158) Marsh, M. C.
An instrument for the measurement of the thickness of compressible solids. Jour. Sci. Instruments 6 (12): 382-384. 1929.
The thickness gage is equipped with an electrical attachment to indicate when contact is made.

(159) Peirce, F. T.
See citation (101)

(160) Rubner, M.
Sphärometer mit variirbarer Belastung. [Spharometer

with variable load.] Arch. Hyg. 27: 44-48, illus. 1896.
Description of the instrument used by continental investigators to determine the thickness of compressible materials.

(161) Schiefer, H. F.
The compressometer, an instrument for evaluating the thickness, compressibility, and compressional resilience of textiles and similar materials. Bur. Standards Jour. Research 10: 705-713, illus. 1933.
The compressometer is designed to determine the thickness of a specimen at pressures from 0.1 to 2.0 pounds per 1 square inch. The experimental method as well as a description of the instrument is given.

(162) Schofield, J.
Porosity; a primary property in textiles. Jour. Soc. Dyers and Colourists 46 (11): 368-375, illus. 1930. [Abstract in Jour. Textile Inst. 22: A202-A203. 1931.]
Part II describes an instrument that measures the mean thickness over an area of 16 square inches.

(163) Spafford, A. L.
See citation (146).

ULTRA VIOLET TRANSMISSION.

(164) Alexander, F. W.
Textile fabrics: ultra-violet transmission. [Abstract] Jour. Textile Inst. 17: A239. 1926. Simple portable photometer for gauging intensity of ultra-violet rays. [Abstract.] Analyst 51: 54. 1926.
The experimental method for determining ultra-violet transmission is described. The order in which the fabrics transmit the near ultra-violet is reported.

(165) Barratt, T.
Measurement of the transparency of a fabric. Faraday Soc. Trans. 20 (pt.2): 236-239, illus. 1924.
The method for measuring transparency is described and the values for four fabrics are reported.

(166) Coblentz, W. W., Stair, R., and Schoffstall, C. W.
Some measurements of the transmission of ultra-violet radiation through various kinds of fabrics. U. S. Dept. Com., Bur. Standards Jour. Research 1 (2): 105-124, illus. 1928.
Various kinds of cotton, natural silk, rayon, linen, and wool fabrics were studied. The amount of radiation transmitted directly through the yarns was measured.

(167) Freytag, H.
Über die Verwendung des lichtelektrischen Reflexions - und Beleuchtungsmessers nach Dr. B. Lange. [Concerning the application of the photoelectric reflection and illumination meter by Dr. Lange.] Faserforschung 11: 192-200. 1935. [Abs. in Jour. Textile Inst. 26 (8): A419. 1935]
Includes a description of the apparatus and the experimental method for measuring the percentage of transmitted and reflected light.

(168) Hess, K., Hamilton, J. O., and Justin, M.
Protection afforded the skin against sunburn by textile fibers. Jour. Agr. Research [U. S.] 35: 251-259, illus. 1927.
The ratio of the time required to burn the skin when it is protected by certain fabrics and when it is unprotected was determined experimentally. Sunlight and ultra-violet lamps were used.

(169) Hirst, H. R., King, P. E., and Lambert, P. N.
Transmission of ultra-violet radiation by various fabrics. Jour. Soc. Dyers and Colourists 44: 109-113, illus. 1928.
In this study the thickness of fabric necessary to cut off the ultra-violet rays was taken as a measure of the transparency. It shows that weave and texture are the chief factors controlling the transmission of light rays.

(170) Mörikofer, W.
Die Durchlässigkeit von Bekleidungsstoffen für Sonnenstrahlung verschiedener Spektralbereiche. [The transmission of clothing materials for sunlight of different spectral regions.] Strahlentherapie 39: 57-79. 1930. [Abstract in Leipziger Monatsschr. Textil Indus. 47: 23. 1932.]
An experimental method to study the transmission of light of different wave lengths through fabric is described.

(171) Weltzien, W.
Ultra-violet radiation in textile research. Amer. Dyestuff Reptr. 19: 825. 1930. (from Seide 35: 195.)
The radiation from two mercury vapor lamps and a carbon arc was studied. The mercury lamp is low in intensity but has a purer ultra-violet radiation, that is, freer from red radiation.

WATER ABSORPTION

(172) Black, C. P., and Matthew, J. A.
The physical properties of fabrics in relation to clothing. Part II. Water vapour permeability of fabrics. Jour. Textile Inst. 25 (7): T225-T240. 1934.
This method is based upon determining the loss in weight with time of water in a vessel covered with the test fabrics at constant temperature, constant humidity, and controlled small air movement.

(173) Gregory, J.
Transfer of moisture through fabrics. Jour. Textile Inst. 21 (2): T66-T84, illus. 1930.
Experimental methods are given for studying the rate and the mechanism of transfer of moisture through fabrics.

(174) Hamm, H. A., and Jessup, D. A.
A comparison of methods for determination of moisture in textiles. Amer. Dyestuff Reptr. 18: [637]-639. 1929.
The variations in moisture content were studied for samples which were dried in two types of conditioning ovens, by toluene distillation, and in a desiccator with sulphuric acid.

(175) Hess, K., and Readheimer, D.
A comparison of methods for determining the absorption of water by fabrics. Jour. Home Econ. 26 (5): 298-303, illus. 1934.
Compares three methods of determining water absorption and suggested modifications for two methods.

(176) ______ ______
The determination of absorption of water by fabrics. Amer. Dyestuff Reptr. 23 (27): [715]-716, 743, illus. 1934.
See citation (175).

(177) Sale, P. D., and Hedrick, A. F.
See citation (144).

(178) Shorter, S. A.
Moisture content of wool - its relation to scientific theory and commercial practice. Jour. Soc. Dyers and Colourists 39: 270-276, illus. 1923.
A discussion of regain and the method for determining it.

(179) Stevenson, L., and Lindsay, M.
Methods of testing the absorption of water by cotton toweling. Jour. Home Econ. 18: 193-198. 1926.
Five methods of testing for water absorption are described. Four methods give the same rating of the fabrics.

WATERPROOFNESS

(180) Anonymous.
Report of the sub-committee on waterproof standards. Amer. Dyestuff Reptr. 18: 523-525. 1929. [Abstract in Chem. Abs. 23 (19): 4826. 1929.]
Includes a brief description of a hydrostatic pressure apparatus used by the American Association of Textile Chemists and Colorists for measuring resistance of fabrics to water.

(181)__________
Impermeabilisation des tissus de coton et de lin. [Impermeability of cotton and linen fabrics.] Tiba 8 (2): 147-155. 1930.
A resume is given of methods of testing for waterproofness.

(182) Appel, W. D.
The critical chemist and colorist. Amer. Dyestuff Reptr. Sample Swatch Quarterly (Jan. 19): 52-55. 1931.
The various methods for testing waterproofness are discussed and a box method is proposed.

(183) Barr, G.
The determination of waterproofness of "porous" waterproof fabrics. [Gt. Brit.] Dept. Sci. & Indus. Research. Rept. 2 of the Fabrics Co-ordinating Research Com., pp. 113-139, illus. 1930. [Abstract in Chem. Abs. 24: 3375, 1930.]
An experimental method is reported. The apparatus uses hydrostatic pressure which is increased at a constant rate.

(184) Bundesmann
Eine neue Apparatur zur Gebrauchswertprüfung wasserabstossend imprägnierter Textilien. [A new apparatus for testing the water-repellence of proofed textiles.] Melliand Textilber. 16: 128-131; 211-213; 331-332; 663-664; 739-740. 1935.
In this apparatus the underside of the fabric is rubbed while it is exposed to a uniform shower. The amount of water taken up and the amount passing through are determined. Four determinations can be made simultaneously. The accuracy of the different factors was studied. Tabular data are included.

(185) Burr, A. H.
A simple constant drop apparatus. Jour. Soc. Dyers and Colourists 44: 18-19, illus. 1928. [Abstract in Jour. Textile Inst. 19: A139. 1928.]
The drop test for measuring waterproofness of fabrics is described.

(186) Hays, M. B.
Methods of testing waterproofed fabrics. Jour. Home Econ. 22: 675-679, illus. 1930.
A simple apparatus employing hydrostatic pressure is described. The sample is required to withstand a certain pressure for 1 hour.

(187) Jarrell, T. D., and Holman, H. P.
Effectiveness of materials used for waterproofing canvas, and their influence on the fabric. Textile World 73: [3103]-3105. 1928.
A system is given for rating the fabrics when using the funnel test.

(188) Martin, G., and Wood, J.
Notes on the quantitative testing of rainproof and waterproof cloth. Jour. Soc. Chem. Indus. 38: T84-T87, illus. 1919. [Abstract in Chem. Abs. 13: 1932-1933. 1919.]
The various experimental methods are discussed. The drop test is the most efficient in the opinion of the authors.

(189) Mecheels, O.
Über die wasserabstossende Imprägnierung von Geweben. [Concerning the waterproofing of fabrics.] Melliand Textilber. 15 (1): 20-21, illus. 1934.
With the apparatus described the underside of the material is rubbed while a shower falls on it from a height of 1 meter.

(190) Rolfe, E.
Testing the quality of waterproofed textile fabrics. Dyer and Calico Printer 67: 632-633, illus. 1932. [Also in Amer. Dyestuff Reptr. 21: 535-536. 1932.]
Hydrostatic pressure is employed in this apparatus.

(191) Smith, W. C.
An accelerated aging test for waterproofed ducks and similar fabrics. Amer. Dyestuff Reptr. 22: 114-118, illus. 1933. [Abs. in Jour. Textile Inst. 24: A221. 1933.]
Describes a modified box test for exposing fabrics to a constant hydrostatic pressure from 0 to 20 1/2 inches and for measuring the amount and rate of leakage through the sample as well as the hydrostatic pressure at which leakage occurs.

(192) Toyne, F. D.
The testing waterproof fabrics. Ind. Chemist 10: 380. 1934. [Abs. in Jour. Textile Inst. 26 (1): A44. 1935.]
The drop test is used on the fabric when it is stretched a definite amount across a funnel. The proof value is the time required for 5 cc to pass through.

(193) Veitch, F. P., and Jarrell, T. D.
Determination of the water resistance of fabrics. Jour. Indus. and Engin. Chem. 12: 26-30, illus. 1920. [Also in Textile World Jour. 57: 2811-2813, 1920.]
Modifications of the funnel and spray tests are reported.

(194) Williams, H. M.
Limitations of the "drop" test. Wool Record and Textile World 33: 1299-1301. 1928. [Abs. in Jour. Textile Inst. 19: A297. 1928.]
The author considers that the drop test is an inadequate test for cloths of homespun character.

(195) Wosnessensky, N. N.
The penetrometer and its importance in determining the water resistance of fabrics. Repts. of the All-Russian Textile Indus., pp. 11, 19. 1923. [Trans. in Amer. Dyestuff Reptr. 13: 781-783, 794. 1924. Original not seen.]
Advocates an instrument using hydrostatic pressure for testing the water resistance of fabrics.

YARN NUMBER

(196) Bradbury, F.
Calculations in yarns and fabrics. 322 pp., illus. Halifax, F. King and Sons. [n. d.]
Chapters on resultant and average yarn numbers, as well as the diameter of threads, are included.

(197) Fowle, E. D.
"Typp" a basis for numbering all yarns. Textile World 81 (17): 1470-1473. 1932.
Typp meaning "thousand yards per pound" is proposed as a universal numbering system.

(198) "Tester"
II.-The testing of yarn for count. Wool Rec. and Textile World 39: 163, 165, 167, illus. 1931.
A yarn extension testing machine designed by Prof. Barker is described, and the change in yarn number upon finishing a cloth is discussed.

(199) Woodhouse, T.
Yarn counts and calculations. 119 pp., illus. London, Henry Frowde and Hodder & Stoughton. 1921.
Definitions, yarn counts, and tables for converting from one system to another are given. Yarn twist and angle of twist are also discussed.

YARN TWIST

(200) Anonymous.
Tester for determining twist and twist take-up developed by United States Testing Co. Rayon and Synthetic Yarn Jour. 14 (8): 14-15. 1933.
Describes an attachment for twist counters now in use that will regulate tension in placing yarns in the clamps.

(201) Chase, W. N.
Short cut to twist. Textile World 84 (12): 2207-2208, illus. 1934.
The experimental technic given is particularly adapted for determining twist of single-ply yarns.

(202) Schwarz, E. R.
An introduction to the micro-analysis of yarn twist. Jour. Textile Inst. 24 (3): T105-T118, illus. 1933.
The author recommends an optical measurement of the twist of single yarn.

(203) Woodhouse, T.
See citation (199).